

# **Wupatki Trails / Lenox Corridor Meeting II**

**Wednesday November 7, 2012  
6:30 – 8:30 PM**





# *Welcome and Introductions*

**Supervisor Liz Archuleta**

**District 2**

**Coconino County**



# *Opening Remarks*

**Lucinda Andreani**  
**Coconino County**

# *Opening Remarks*

## **Tonight's Goals**

- **Give Thanks**
  - Your neighborhood's desire to work together towards collective watershed restoration and flood mitigation has made further design possible
- **Review and Discuss Proposed 30% Plans**
- **Discuss Next Steps**

# *Flood Insurance*

## **Purchasing and Maintaining Flood Insurance is CRITICAL**

- EWP Watershed Restoration & Flood Mitigation Measures will not Eliminate ALL Flood Risks
- Flood Insurance **MUST** be Renewed Annually
- Rate can be “Grand-Fathered” in if Insurance is Maintained

## *Proposed 30% Designs*

### **Reminder - Integrated Design Critical**

- Watershed Restoration on Forest
- Wupatki Trails Corridor – Channel from Forest to Lenox Road
- **Forest Measures Contingent on Neighborhood Measures and Vice-Versa**

# *Proposed 30% Designs*

## **Design Considerations**

- 5 Year, 24 Hour Design Storm Accounting for 2 Years of Soil and Vegetative Recovery
  - Water Quantity is +/- 130 Cubic Feet Per Second
  - Water Velocity is +/- 7 to 12 Feet Per Second
- Create No Adverse Impacts
- Achieve a Positive Cost/Benefit Ratio
- Revegetate Measures on Forest and Private Property

# *Alignment Options*

## **Neighborhood:**

- Technical Issues
  - Utility Conflicts
  - Driveway Crossings
  - Space Available for Channel
  - Financial Issue
- ***EXCEEDS Benefit /Cost Ratio***



# *Alignment Options*

## **Highway:**

- Follows Historic Flow Path
- Only 2 Road Crossings
- Very Limited Utility Issues

➤ ***WITHIN Benefit /Cost Ratio***

# *Process Steps Moving Forward*

## **Still Many Steps Needed**

- Secure Drainage Easements
- Finalize Engineering
- Secure All Required Approvals
  - US Forest Service for On-Forest Measures
  - NRCS for All Final Designs & Costs
  - Work with ADOT – Encroachment Permit
  - County Board of Supervisors (Flood Control District) for EWP Match, and Non-EWP Covered Costs
- Engage in Contracting Process

# *Design Considerations*

## **BENEFITS:**

- Safety
- Financial
- Utilities and Road Maintenance and Access

# *Proposed 30% Designs*

## **Basis of Design – Two Sections**

- **On-Forest Measures**
  - Natural Channel Design, Inc.
- **Forest Boundary to Lenox Road**
  - Civiltec Engineering, Inc.

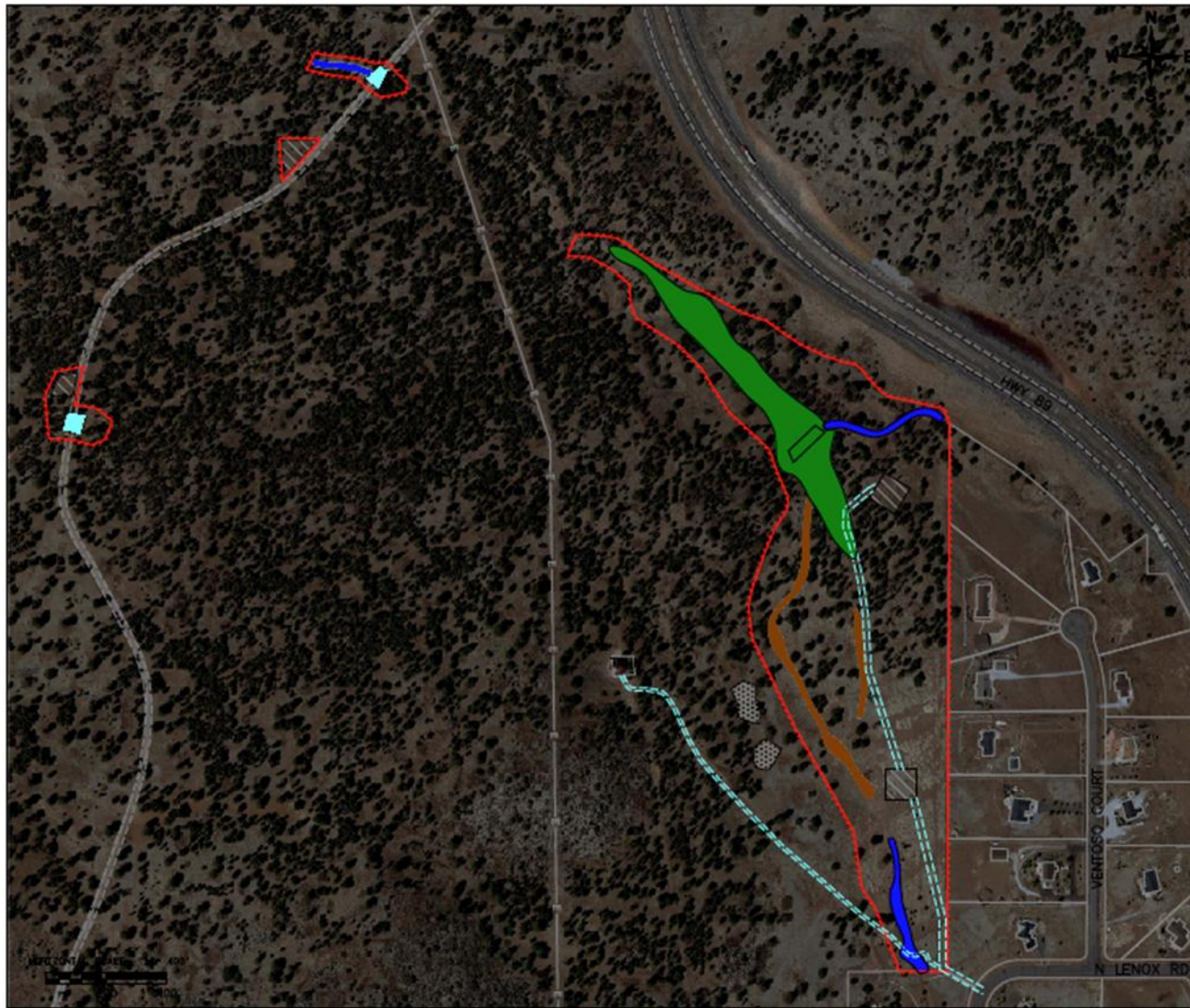


# *30% Design On-Forest Measures*




**Natural Channel Design, Inc.**

**Watershed Restoration Measures  
On Forest**

# Lenox Watershed Restoration Overview

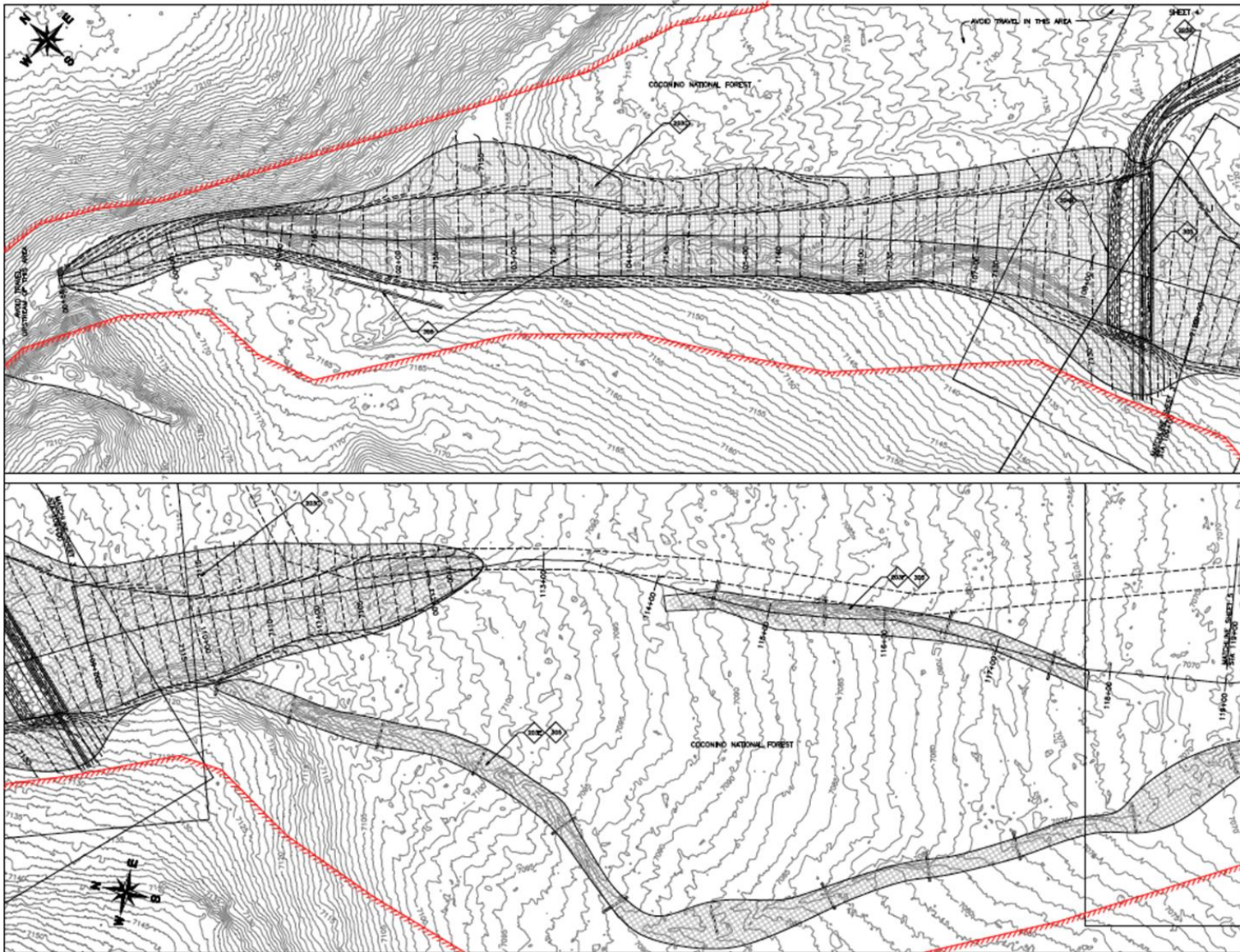


## LEGEND:

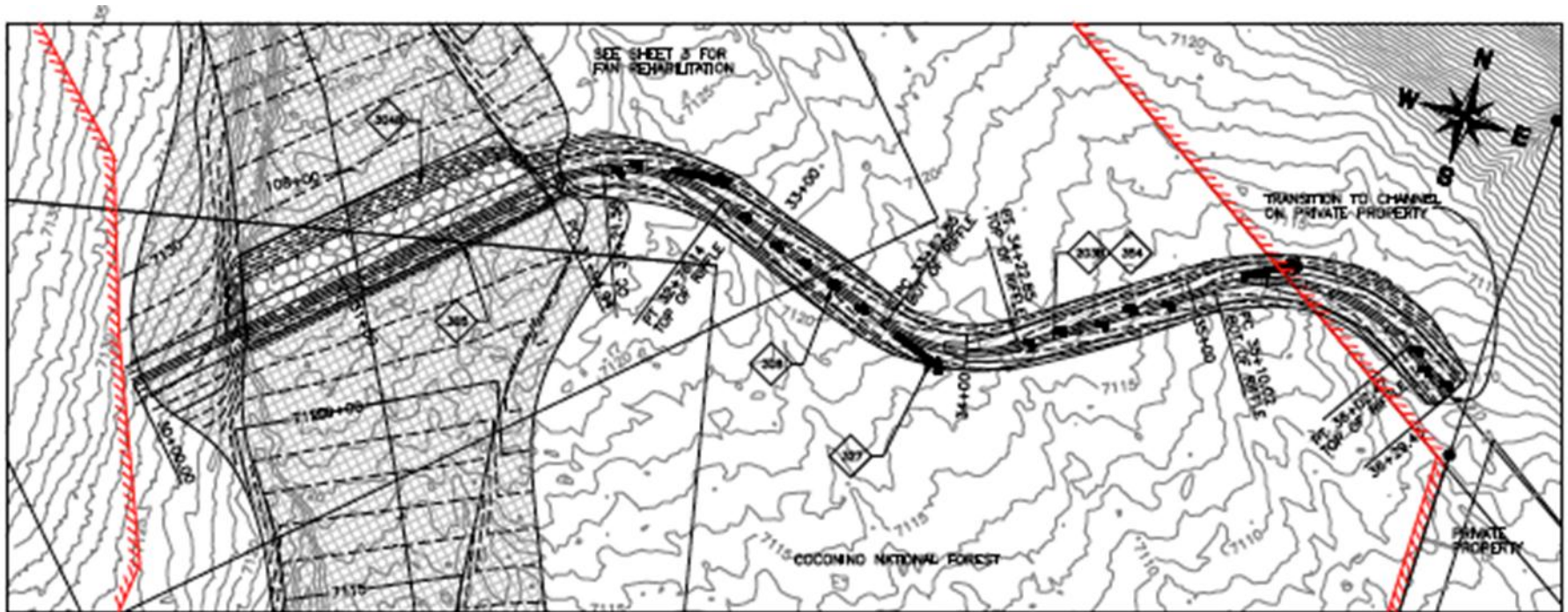
-  NEPA BOUNDARY
-  ROADS
-  PROJECT ACCESS
-  ALLUVIAL FAN REHABILITATION
-  CHANNEL RESTORATION
-  GULLY FILL & SMOOTHING
-  LOW-WATER CROSSING
-  PROPOSED STAGING AREA
-  ROCK PILES (APPROX)



# Lenox Alluvial Fan Restoration



# ***Transition Channel From Terminal Fan to USFS Boundary***

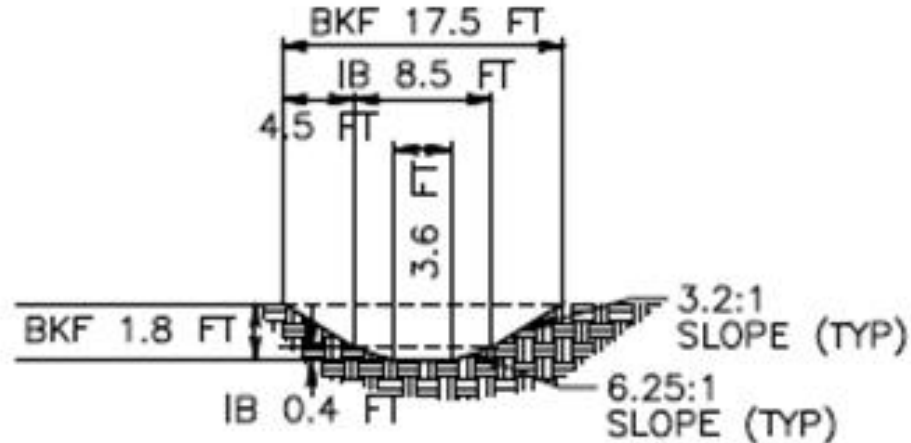




# Channel Cross Section

## TYPICAL CHANNEL CROSS SECTIONS – RIFFLE TRANSITION CHANNEL, LENOX WATERSHED

WATERSHED AREA	2.86 SQ MI
BANKFULL AREA	20.6 SQ FT
BANKFULL WIDTH	17.5 FT
DESIGN DISCHARGE (Q5, 24 HR)	130 CFS



TYPICAL RIFFLE CROSS-SECTION (NTS)  
LENOX WATERSHED, TRANSITION CHANNEL

## ***Alluvial Fan Restoration: Trail Creek Colorado***





***Stream Channel  
Restoration:  
Trail Creek Colorado***





# ***30% Design Forest Boundary to Lenox Road***

**Civiltec Engineering, Inc.**

**Forest Boundary  
to  
Lenox Road**



# 30% Designs – Forest Boundary to Lenox Road





# ***30% Designs – Forest Boundary to Camino de los Vientos***



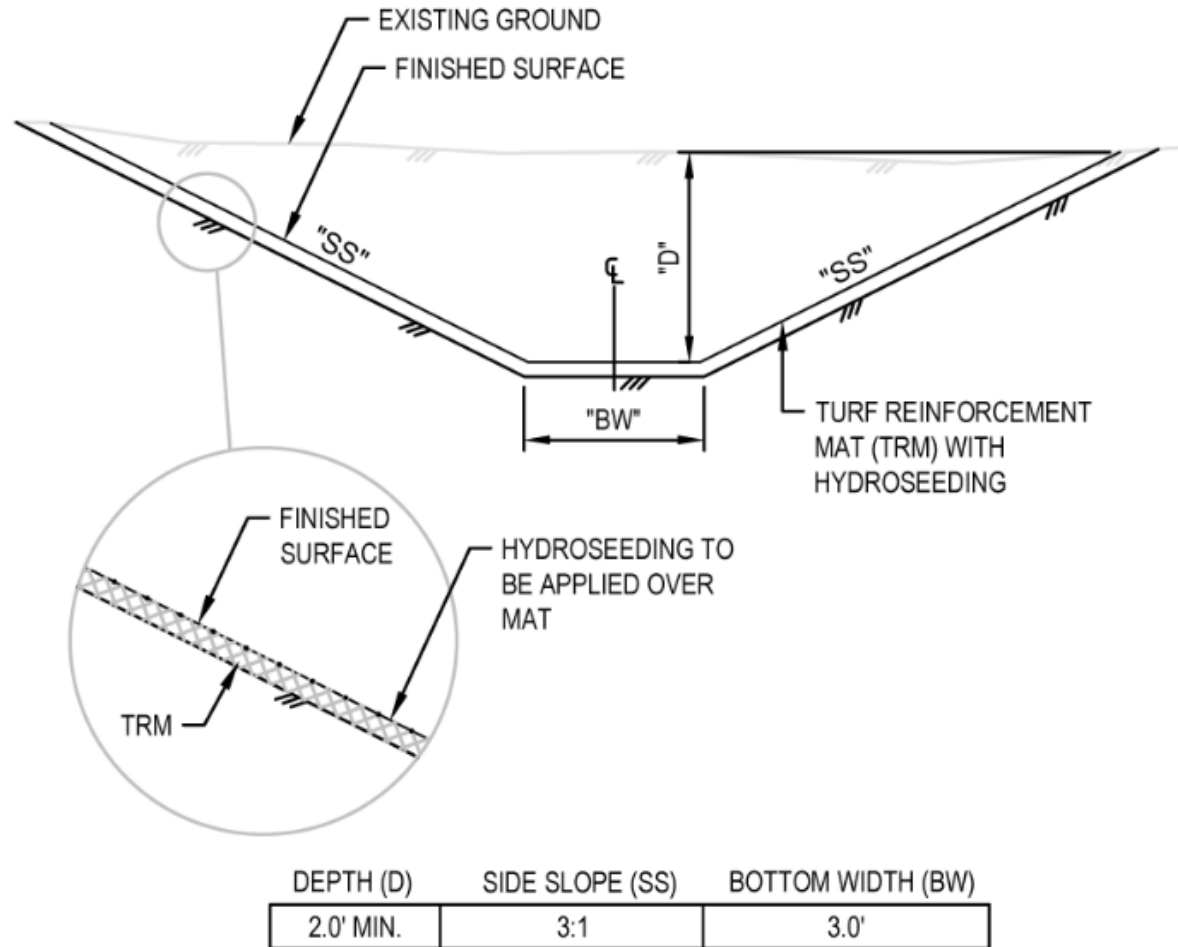


# ***30% Design –Camino de los Vientos to Lenox Road***



# 30% Designs – Forest Boundary to Lenox Road

## Typical Channel Cross Section – Turf Reinforcement Mat



CHANNEL TYPICAL SECTION

NOT TO SCALE

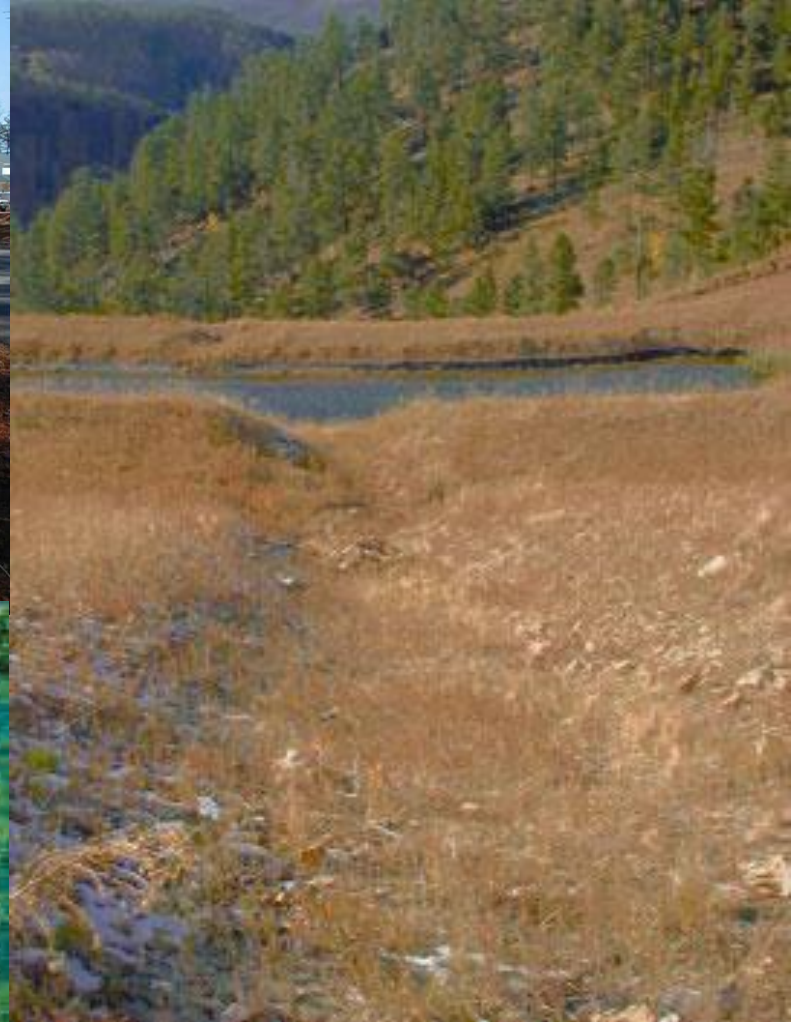


# ***Turf Reinforcement Mat Revegetation***





# ***Turf Reinforcement Mat Revegetation***





# *Cost/Benefit Analysis, No Adverse Impacts and Moving Forward...*

**Lucinda Andreani**  
Coconino County

# ***Cost/Benefit Analysis***

## **Costs Are Still Preliminary**

- On-Forest Measures:  
\$300,000 to \$400,000
- Forest Boundary to Lenox Road:  
\$350,000 to \$425,000
- Total: \$650,000 to \$825,000



# *No Adverse Impact FLO-2D Modeling*

## **Floods**

- Debris & Mud Flow
- Water Floods
- Pre and Post-Mitigation Modeling

## **Sediment**

- Deposition
- Scour

## **Structures**

- Culverts, Basins, Levees, Channels, Walls



# FLO-2D Pre-Measure Analysis

## Legend

Flow Depth at Cell  
feet

0.010 - 0.500

0.501 - 1.000

1.001 - 1.500

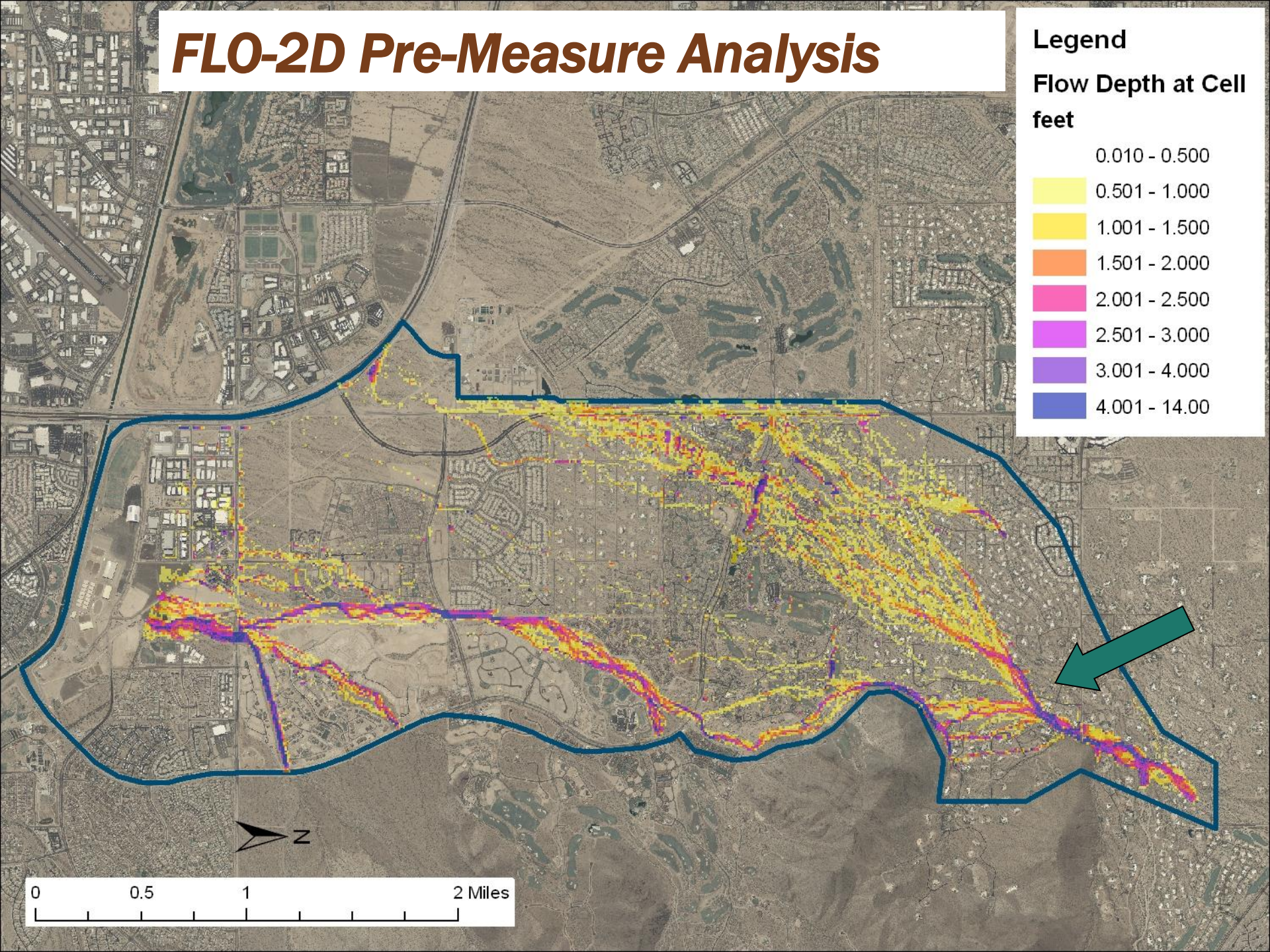
1.501 - 2.000

2.001 - 2.500

2.501 - 3.000

3.001 - 4.000

4.001 - 14.00





# ***FLO-2D Post-Measure Analysis***

## Legend

Flow Depth at Cell  
feet

0.010 - 0.500

0.501 - 1.000

1.001 - 1.500

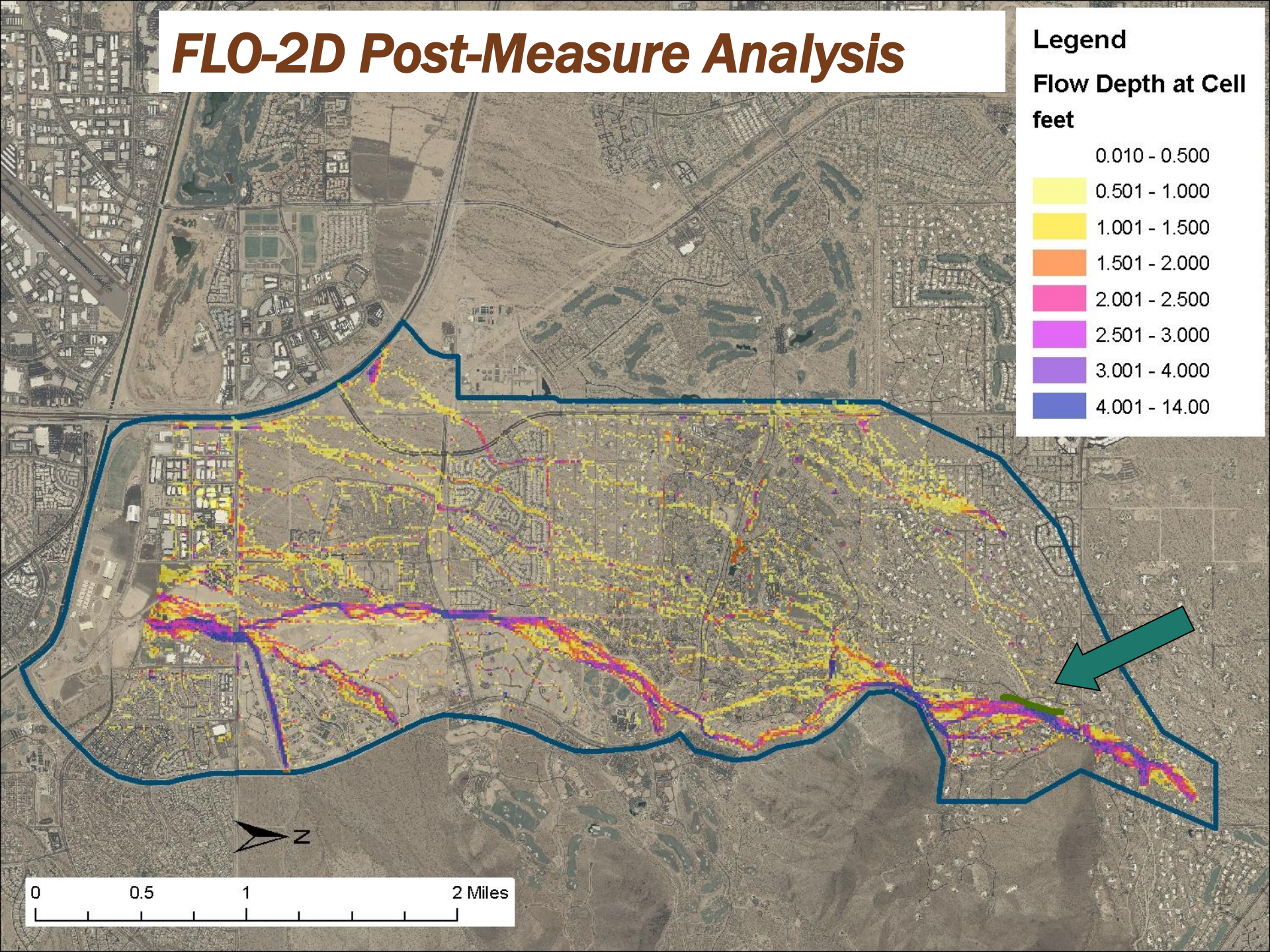
1.501 - 2.000

2.001 - 2.500

2.501 - 3.000

3.001 - 4.000

4.001 - 14.00



0 0.5 1 2 Miles



# ***Moving Forward...***

## **Next Steps**

- **Preliminary Timeline for Final Engineering Plans, Costs and FLO-2D Analysis**
  - January, 2012
- **Securing Drainage Easements**
  - Now – Top Priority
- **Preliminary Construction Timeline**
  - Spring 2012
- **Time Line Contingent on Securing Drainage Easements**



# *Resources*

## **Please Direct All Questions and Comments To:**

- Schultz Flood Hotline: (928) 679-8390
- Schultz Flood Email:  
[schultzfloodmitigation@coconino.az.gov](mailto:schultzfloodmitigation@coconino.az.gov)



*Thank You!*

## **Breakout Sessions to Review Preliminary Plans**